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E R R A T A

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Please note that Figure 2 and Figure 3 are reversed in “State Responsibility and Climate Change: Could Canada be Liable to Small Island States?” by Philip Barton. Figure 3, which appears on page 82 should appear on page 80 as Figure 2 and Figure 2 on page 80 should appear on page 82 as Figure 3.

We apologize for this error.

STATE RESPONSIBILITY AND CLIMATE CHANGE: COULD CANADA BE LIABLE TO SMALL ISLAND STATES?

PHILLIP BARTON^I

ABSTRACT

The projections of human-induced climate change by the Intergovernmental Panel on Climate Change have many low-lying island nations gravely concerned about their vulnerabilities to sea-level rise and extreme weather. Small island states jointly contribute less than 1% of global greenhouse gas (GHG) emissions annually yet may experience some of the most severe consequences of climate change. This article investigates whether Canada could be liable if one of these nations turns to the International Court of Justice (ICJ) to compensate for environmental impacts flowing from GHG emissions. Given the uncertainty in the liability standard that would be applied by the ICJ in a claim of state responsibility, this article assesses whether Canada would be liable on the more strict standard of culpability than strict liability – that of negligence. If the theory of “market share liability” were applied to the negligent portion of Canada’s contribution to global GHG emissions (currently less than 2%), the percentage apportioning of damages could still be an enormous future liability.

I. INTRODUCTION

There is currently an international scientific consensus that the impacts of climate change are now being experienced around the world and these impacts are projected to become increasingly worse in the years to come:

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... we support the [Intergovernmental Panel on Climate Change's] conclusion that it is at least 90% certain that temperatures will continue to rise, with average global surface temperature projected to increase by between 1.4° and 5.8°C above 1990 by 2100. This increase will be accompanied by rising sea levels; more intense precipitation events in some countries and increased risk of drought in others; and adverse effects on agriculture, health and water resources. ... It is now evident that human activities are already contributing to global climate change. ... The balance of scientific evidence demands effective steps now to avert damaging changes to Earth's climate.¹

This global concern results from the fact that human activities have increased the atmospheric concentrations of greenhouse gases to unprecedented levels. The atmospheric concentration of the main greenhouse gas (GHG), carbon dioxide (CO₂),² has increased 31% over pre-industrial levels; for several thousand years the concentration of CO₂ was 280 ppm ±10 ppm but has risen to 367 ppm in 1999 and continues to increase by 1.5 ppm each year.³ It is important to recognize that the “present CO₂ concentration has not been exceeded during the past 420,000 years and likely [66-90% probability] not during the past 20 million years.”⁴ It is generally believed that GHGs contribute to increases in the planet's temperature. During the 20th century, the Intergovernmental Panel on Climate Change (IPCC) estimates that the global surface temperature has increased by about 0.6°C and that “it is very likely [90-99% probability] that the 1990s was the warmest decade and

¹ A joint statement issued by the Australian Academy of Sciences, Royal Flemish Academy of Belgium for Sciences and the Arts, Brazilian Academy of Sciences, Royal Society of Canada, Caribbean Academy of Sciences, Chinese Academy of Sciences, French Academy of Sciences, German Academy of Natural Scientists Leopoldina, Indian National Science Academy, Indonesian Academy of Sciences, Royal Irish Academy, Accademia Nazionale dei Lincei (Italy), Academy of Sciences Malaysia, Academy Council of the Royal Society of New Zealand, Royal Swedish Academy of Sciences, Turkish Academy of Sciences, and Royal Society (UK) on May 18, 2001 in Science 292(1261)

² This article refers to greenhouse gases (GHGs) as a proxy for all six of the greenhouse gases which are the focus of the Kyoto Protocol but for simplicity will only focus on carbon dioxide. See: *Kyoto Protocol to the United Nations Framework Convention on Climate Change*, 11 Dec 1997, (1998), 37 Int. Leg. Mat. 32, [hereinafter *Kyoto Protocol*].

³ Intergovernmental Panel on Climate Change. *Climate Change 2001: The Scientific Basis. Contribution of Working Group I to the Third Assessment Report of the Intergovernmental Panel on Climate Change*, ed. by J.T. Houghton, Y. Ding, D.J. Griggs, M. Noguer, P.J. van der Linden, X. Dai, K. Maskell, and C.A. Johnson (New York: Cambridge University Press, 2001) at 185.

⁴ *Ibid.* at 7.

1998 the warmest year in the instrumental record, since 1861.”⁵ The IPCC estimates that the spring and summer sea-ice extent in the Northern Hemisphere has decreased by about 10 to 15% since the 1950’s and that “there has been widespread retreat of mountain glaciers in non-polar regions during the 20th century.”⁶ In the latest IPCC scientific assessment report, scientists estimate that the global average sea level rose between 0.1 and 0.2 meters during the 20th century. In addition to investigating the past and current climate for signs of human interference, the IPCC also projects the future consequences of continuing down the current path of doing nothing to reduce current GHG emission levels.

In order to estimate climate change at the end of this century, the IPCC has developed over 30 future scenarios which estimate global GHG emissions to the year 2100.⁷ These scenarios were created by making a variety of different assumptions on the three most important forces affecting GHG emissions: population growth, socio-economic development and technological change. But all of these scenarios have one thing in common – they assume that no nations undertake any climate change initiatives to reduce GHG emissions. This translates into projections that by 2100, atmospheric CO₂ will be at least 540 ppm and could be as high as 970 ppm (between 90% and 250% greater than the preindustrial level of 280 ppm).⁸ When the full range of these emission scenarios are programmed into the sophisticated climate models in use today, the projected changes between 1990 and 2100 are that:

- global mean surface temperature will increase at least 1.4°C and as much as 5.8°C⁹
- global mean sea level will rise between 0.09 and 0.88 meters (due primarily to the thermal expansion of the oceans and the loss of mass from glaciers and ice caps)¹⁰

⁵ *Supra* note 3 at 2.

⁶ *Supra* note 3 at 4.

⁷ Intergovernmental Panel on Climate Change, *Emission Scenarios: A Special Report of Working Group III of the Intergovernmental Panel on Climate Change – Summary for Policymakers*, (New York: Cambridge University Press, 2000) at 3.

⁸ *Supra* note 3 at 12.

⁹ *Supra* note 3 at 13.

¹⁰ *Supra* note 3 at 16.

- peak wind intensities in tropical cyclones will likely increase¹¹
- mean and peak precipitation intensities in tropical cyclones will likely increase¹²

Furthermore, “global mean surface temperature increases and rising sea level from thermal expansion of the ocean are projected to continue for hundreds of years after stabilization of greenhouse gas concentrations (even at present levels), owing to the long timescales on which the deep ocean adjusts to climate change.”¹³ Therefore, the earth may already be committed to some degree of climatic changes regardless of whether any climate policy initiatives get implemented.

The scenarios and projections demonstrate that if GHG emissions by the world’s nations are not severely reduced, the atmospheric concentrations of greenhouse gases will continue to rise and continue to upset the planet’s natural thermostat. Without these sharp emission reductions, the small island states of the world may incur severe environmental impacts such as sea-level rise and increased frequency and severity of extreme weather events such as tropical cyclones.

The Alliance of Small Island States (AOSIS) was formed in 1990 to argue for these sharp emission reductions. The Alliance now has 43 members and has voiced loud concern at international climate change negotiations.¹⁴ This coalition has been strenuously arguing for, *inter alia*, strong international community adoption of the Precautionary Principle from Principle 15 of the 1992 *Rio Declaration on Environment and Development*.¹⁵ The essence of this principle is that nations should take appropriate action now if there is a future risk of environmental harm – lack of full scientific certainty should not stand in the way of preventative action.

While the international climate negotiations have seen some success, global GHG emissions have continued to rise. This limited success includes the creation of the *United Nations Framework Convention on*

¹¹ *Supra* note 3 at 15. But the future changes in tropical cyclone location and frequency are uncertain.

¹² *Supra* note 3 at 15.

¹³ *Supra* note 3 at 17.

¹⁴ Alliance of Small Island States. Background. <<http://www.sidsnet.org/aosis/background.html>>

¹⁵ *Rio Declaration on Environment and Development*. U.N. Doc.A/CONF.151/5/Rev. 1; (1992), 31 Int. Leg. Mat. 874.

*Climate Change*¹⁶ (of which the ultimate objective is “stabilization of greenhouse gas concentrations in the atmosphere that would prevent dangerous anthropogenic interference with the climate system”) and the development of the 1997 *Kyoto Protocol*.¹⁷ However, the present reality is that the GHG emissions of most nations have continued to rise and global fossil fuel GHG emissions have increased 8% between 1990 and 1998 (from 6096 to 6608 million metric tonnes of carbon).¹⁸ Furthermore, it is still highly uncertain whether the *Kyoto Protocol*’s average emission reductions of at least 5% below 1990 levels by 2008 to 2012 will ever be successfully attained.¹⁹

AOSIS wants the international community to adopt strong policy measures now to curtail emissions, prevent the onset of serious climate change and thereby prevent further damage to their vulnerable small island states. AOSIS wants nations to adopt the Precautionary Principle so that effective action is taken *before* damage occurs.²⁰ Indeed, there may be legal incentive for nations to do so.

Should the trend of GHG emissions continue to the point where small island states suffer, members of AOSIS may turn to the International Court of Justice (ICJ) to obtain compensation for the harms they have suffered as a result of climate change.²¹ The objective of this article is to assess whether Canada could be liable for the transboundary environmental damage induced by climate change. The first part of this

¹⁶ *United Nations Framework Convention on Climate Change*. C.T.S. 1994/7; UNTS 1771/107.

¹⁷ *Kyoto Protocol*, *supra* note 2. The Kyoto Protocol is an international treaty in which industrialized countries commit to reduce their national GHG emission levels by an average of 5.2% below the levels that existed in 1990. However, this treaty has not been ratified by the required minimum of nations so has yet to enter into force.

¹⁸ G. Marland, T.A. Boden & R.J. Andres, “Global, Regional, and National CO₂ Emissions” in *Trends: A Compendium of Data on Global Change* (Oak Ridge, Tenn: Carbon Dioxide Information Analysis Center, Oak Ridge National Laboratory, United States Department of Energy, 2001). <<http://cdiac.esd.ornl.gov/trends/emis>>

¹⁹ S. Oberthur & H.E. Ott, *The Kyoto Protocol: International Climate Policy for the 21st Century*, (Heidelberg, Germany: Springer-Verlag, 1999) at 121.

²⁰ *Supra* note 14. The possibility of harmed countries suing those states responsible has been the speculation of several academics.

²¹ D. Zaelke & J. Cameron, “Global Warming and Climate Change – An Overview of the International Legal Process” (1990) 5 Am. U.J. Int’l L. & Pol’y 236; M. Mackinnon, “Poor nations hurt by rich might have legal case” *The Globe and Mail*, July 12, 2001 at A8 (this article includes speculation by Andrew Strauss, a law professor at Widener University, Delaware, U.S.A.).

article reviews the cases, declarations and treaties which exist in the area of environmental state responsibility. As a result of the uncertainty in the liability standard that would be applied by the ICJ – the second part of this article investigates if Canada could be liable by a *higher* degree of culpability than strict liability – that of negligence. If liable negligently, one would be responsible on the basis of strict liability as well. It is important for policy-makers to recognize that their decisions today could result in future liability.

To analyse Canada's liability, this article supposes a legal claim being made at the ICJ by Palau, a sovereign nation and member of AOSIS in the South Pacific, consisting of 200 islands which vary from numerous low-lying coral islands to a 400-foot elevation on the main island. (Palau has a current population of 19,000 on an area of only 488 square kilometers).²² Although Palau might be able to pursue a claim against Canada in Canadian court jurisdiction, this article does not pursue that possibility. Moreover, while GHG emissions are in fact produced by private persons within Canada's jurisdiction, this article uses Canada as the relevant legal actor.²³

I. STATE RESPONSIBILITY

The first part of this article reviews the international law of state responsibility with an emphasis on Transboundary environmental issues. This is followed by an examination of the applicable liability standard for state responsibility.

For Palau to bring a claim against Canada at the International Court of Justice (ICJ) both countries have to recognize the jurisdiction of this court to adjudicate their dispute. Canada now recognizes the jurisdiction

²² Central Intelligence Agency, *The World Factbook – Palau*. <www.cia.gov/cia/publications/factbook/geos/ps.html>

²³ The essence of this issue is whether Canada could be responsible for failing in its duty to control the conduct of its nationals, whether citizens or corporations, of emitting greenhouse gas emissions. The draft articles of the International Law Commission, *Responsibility of States for Internationally Wrongful Acts*, specify attribution to states in Articles 4 to 11 but these are largely for the conduct of government organs or the conduct of persons empowered to exercise government authority [(2001) Report of the International Law Commission on the Work of its 53rd Session, U.N. Doc. A/CN.4/L.602/Rev.1.].

of the ICJ and the latest declaration was submitted in 1994.²⁴ However, an unfortunate reality of the ICJ is that this recognition is voluntary and could be removed at any time. While Palau has not submitted a declaration recognizing ICJ jurisdiction it is free to do so at any time because it became a member of the United Nations on December 15, 1994.²⁵ Article 93(1) of the *Charter of the United Nations* provides that all members automatically become parties to the *Statute of the International Court of Justice* and Article 35(1) of this *Statute* states that the ICJ is available to all states that are parties.

It is important to note that Palau would have to make the claim in the ICJ because there is no binding dispute resolution mechanisms included in the *United Nations Framework Convention on Climate Change* (UNFCCC).²⁶ While Canada ratified this Convention in 1992 to be enforceable in 1994,²⁷ even if Canada violates its ultimate objective ("stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system"), there is no opportunity for Palau to have any recourse under the terms of the Convention.²⁸

Palau might bring a claim of state responsibility to the ICJ because it is a long-standing principle of international law that one state shall not damage another's environment. This principle was affirmed in the famous *Trail Smelter Arbitration*²⁹ where the United States claimed that serious environmental damages were resulting from the sulphur dioxide emissions of a smelter immediately across the border in Trail, British

²⁴ The Canadian declaration recognizing the jurisdiction of the ICJ can be found at the Court's website: <www.icj-cij.org/icjwww/basicdocuments/basictext/basicdeclarations.htm>. However, Canada has reserved the right to withhold compulsory jurisdiction for complaints with other Commonwealth nations. As a result, some small island states will be prevented from using this avenue.

²⁵ Information available at the website for the International Court of Justice. <www.icj-cij.org/icjwww/basicdocuments/basictext/basicUNmembers.html>

²⁶ *Supra* note 16.

²⁷ *Supra* note 16.

²⁸ In contrast, Articles 279 through 296 of the *United Nations Convention on the Law of the Sea* (UN Doc. A/CONF.62/122 (1982)) imposes dispute resolution on parties which is involuntary and binding. It should be mentioned that an argument might be possible that sea-level rise is damage to the coastal zone marine environment thereby allowing Palau to make use of these dispute resolution mechanisms. This possibility will not be examined in this paper.

²⁹ *Trail Smelter Arbitration: United States v. Canada*. (1931-1941), 3 R.I.A.A. 1905.

Columbia. The tribunal declared that:

Under the principles of international law ... no State has the right to use or permit the use of its territory in such a manner as to cause [environmental] injury by fumes in or to the territory of another or the properties of persons therein, when the case is of serious consequence and the injury is established by clear and convincing evidence.

An important development in this principle of international law was its inclusion in the *Stockholm Declaration* of 1972 of which Canada was a signatory. Principle 21 states:

States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental policies, *and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction.*³⁰

Also, Principle 2 of the *Rio Declaration on Environment and Development* includes a virtually identical restatement of this concept.³¹

The underlying concept of both *Stockholm* Principle 21 and *Rio* Principle 2 is that while sovereign states are free to exploit their resources, states are responsible if their activities damage the environments of other states. In terms of the scope of this article, this concept may be expressed more narrowly as: Canada is free to exploit its fossil fuel resources but must not cause significant climate change-induced impacts to Palau.³² It is important to recognize that this concept is included in the preamble to the *United Nations Framework Convention on Climate Change* and so can fairly be considered a component of the international law surrounding the climate change issue.

1. Liability Standard

Before determining whether Canada would be responsible to Palau for environmental harm, the appropriate method for deciding state liabil-

³⁰ *Stockholm Declaration of the United Nations Conference on the Human Environment*. 1972. U.N. Doc. A/CONF.48/14 Rev.1. [emphasis added].

³¹ *Supra* note 15.

³² The threshold at which environmental state responsibility applies is uncertain – *Stockholm* Principle 21 and *Rio* Principle 2 do not define the threshold but *Trail Smelter* specified “serious consequence”. Nevertheless, it is likely that damage must be at least significant to violate these principles.

ity must be discussed. There are three generally accepted standards by which liability can be determined for accidental harm.³³ In decreasing burden on the plaintiff, these three standards are:

- subjective knowledge of the risk of harm – subjective fault
- negligence – objective fault
- strict/absolute liability – no fault with few or no defences available

Unfortunately there is little agreement as to the applicable standard in the context of international liability³⁴ and very few state liability claims dealing with Tran boundary pollution have actually arisen. The first standard, subjective fault, would be the most difficult for the plaintiff to establish. This was the standard used by the ICJ in the *Corfu Channel*³⁵ dispute where the court had to determine whether Albania had knowledge of the mines which caused the damage to British warships. The court stated that it is “every State’s obligation not to allow *knowingly* its territory to be used for acts contrary to the rights of other states”. Since the court required that Albania have knowledge of the mines, this is subjective fault, which is more difficult to prove than proving that Albania *ought* to have known – the objective standard.

The boundary between strict and absolute liability is unclear because some of the several possible definitions for strict liability overlap those for absolute liability. Strict liability may be liability from simply causing harm, or it may include the imposition of an onus on the defendant to prove that they weren’t negligent.³⁶ The former essentially defines absolute liability for there are no defences available once causation is proved, while the latter allows a defence of due diligence. The less onerous strict liability standard which incorporates the due diligence

³³ The possibility of a country intentionally causing climate change is not considered here – this paper assumes that only the liability standards for accidental harm are important.

³⁴ J. Brunnée, “The Responsibility of States for Environmental Harm in a Multinational Context – Problems and Trends” (1993) 34 *Les Cahiers de Droit* 827 at 835.

³⁵ *Corfu Channel Case (Merits): United Kingdom v. Albania*, [1949] I.C.J. Rep. 4, 17-23. [emphasis added]

³⁶ P.W. Birnie & A.E. Boyle, *International Law and the Environment* (Oxford: Clarendon Press, 1992) at 143; G. Handl, “International Liability of States for Marine Pollution” (1983) *Can. Y.B. Int’l Law* 85 at 94; L.F.E. Goldie, “Concepts of Strict and Absolute Liability and the Ranking of Liability in Terms of Relative Exposure to Risk” (1985) *Neth. Y.B. Int’l Law* 175 at 194.

defence can be distinguished from the negligence standard by recognizing that negligence requires *the plaintiff* to establish the *lack* of diligence. Principle 21 of the *Stockholm Declaration*³⁷ and Principle 2 of the *Rio Declaration*³⁸ are capable of being interpreted as either strict or absolute liability³⁹ – as an “obligation of due diligence or as one of unqualified prevention of harm.”⁴⁰ In the *Trail Smelter Arbitration*⁴¹, it appears that the standard was absolute liability because if the case was of “serious consequence” (a threshold question) and the injury was established by “clear and convincing evidence” then the defendant (Canada) was to be found liable regardless of any fault. However, as several academics have noted, the actual standard was not conclusively determined in this case because Canada agreed, in advance, to the imposition of liability if causation alone was proved.⁴²

Absolute liability finds its origins in the famous case of *Rylands v. Fletcher*⁴³ where the “non-natural use” of land imposed liability if any water escaped onto neighbouring lands regardless of fault.⁴⁴ Absolute liability also exists in international law. In the 1972 *Convention on International Liability for Damage Caused by Space Objects*,⁴⁵ it is stated that “A launching State shall be absolutely liable to pay compensation for damage caused by its space object on the surface of the earth ...” Based on this Convention, Canada successfully pursued the *Cosmos 954 Claim*⁴⁶ against the U.S.S.R. for compensation when their nuclear satellite disintegrated above northern Canada in 1978.

The nearly fifty years of effort by the International Law Commission (ILC) to establish a treaty on state responsibility also offers little assis-

³⁷ *Supra* note 30.

³⁸ *Supra* note 15.

³⁹ P.W. Birnie & A.E. Boyle, *International Law and the Environment* (Oxford: Clarendon Press, 1992) at 91 to 95.

⁴⁰ *Ibid.* at 143.

⁴¹ *Supra* note 29.

⁴² *Supra* note 36 at 145; See also: J. Brunnee, *Acid Rain and Ozone Layer Depletion: International Law and Regulation* (New York: Transnational Publishers, 1988) at 118.

⁴³ (1868), LR 3 HL 330 (HL).

⁴⁴ However, confusion can result because available literature can refer to this as one of strict liability. For example: E.J. Weinrib, *Tort Law: Cases and Materials* (Toronto: Emond Montgomery Publications, 1997) at 531; E.L. Hughes, A.R. Lucas & W.A. Tilleman, *Environmental Law and Policy* 2nd ed. (Toronto: Emond Montgomery Publications, 1998) at 97.

⁴⁵ *Convention on International Liability for Damage Caused by Space Objects*, 29 March 1972, 961 U.N.T.S. 1987.

⁴⁶ *Cosmos 954 Claim (Canada v. U.S.S.R.)*, (1979), 18 Int. Leg. Mat. 899.

tance in determining the appropriate standard. Article 12 in the latest version of the draft articles on the *Responsibility of States for Internationally Wrongful Acts*⁴⁷ states:

There is a breach of an international obligation by a State when an act of that State is *not in conformity with what is required of it by that obligation*, regardless of its origin or character.⁴⁸

Determining breaches based on “what is required ... by that obligation” is not possible with any certainty without knowing what is actually required. One could argue that perhaps the obligation is Principle 2 of the *Rio Declaration*⁴⁹ – that of strict liability. However, both *Stockholm* and *Rio* are non-legally binding “soft law” and the only case law available is *Trail Smelter* – a case over 60 years old. While some academics⁵⁰ express the view that the *Stockholm* Principle 21 represents an existing rule of customary international law and thus a binding obligation, the limited international practice prevents any conclusive determination that it is the applicable standard for Trans boundary environmental damage.⁵¹

What about negligence established through proof of objective fault? Negligence is the standard overwhelmingly used for private injury claims in common law jurisdictions. While no state liability claims have been determined based on the negligence standard, the ICJ can utilize the “general principles of law recognized by civilized nations” as permitted under Article 38 of the *Statute of the International Court of Justice*.⁵² Since the negligence standard is currently being used by many nations which would likely be characterized as “civilized”, the same standard could rightly be adopted in future state responsibility claims.⁵³

At present it is not clear what the applicable standard would be if Palau brought a claim against Canada at the ICJ. Because of this

⁴⁷ *Responsibility of States for Internationally Wrongful Acts*. (2001) Report of the International Law Commission on the Work of its 53rd Session, U.N. Doc. A/CN.4/L.602/Rev.1.

⁴⁸ *Ibid.* [emphasis added].

⁴⁹ *Supra* note 15.

⁵⁰ A. Kiss & D. Shelton, *International Environmental Law* (U.S.A.: Transnational Publishers, 1991) at 130-131.

⁵¹ *Supra* note 34 and note 39 at 143.

⁵² *Statute of the International Court of Justice*, 26 June 1945, C.T.S. 1945/7, p. 48.

⁵³ An important “general principle of law” which would complete an analysis of the possibilities for incorporation into the liability standard used by the ICJ is the civil law’s equivalent of negligence law. However, that investigation is outside the scope of this paper.

uncertainty, the second part of this article investigates Canada's liability according to the standard requiring a greater degree of culpability than that of strict or absolute liability – negligence based on proof of objective fault. If Canada can be made liable on negligence then Canada must also be liable on strict liability.

II. NEGLIGENCE

The first part of the article reviewed the status of state responsibility in the environmental context and concluded with the possibility of negligence being a liability standard applied in the future. Using the negligence standard, this second part of the article investigates whether Canada could be liable to Palau for the damages resulting from climate change. The relevant time to consider the liability is sometime in the indefinite future, when climate change is seriously impacting Palau. This part of the paper is divided into four components: duty of care, standard of care, causation and damage compensation.

1. Duty of Care

The first step in any negligence claim is to establish that A owes a duty of care to B. This duty of care is defined by the boundaries of reasonable foreseeability of the risk of harm – the objective test.⁵⁴ It must be reasonably foreseeable that A's conduct creates a risk of harm to B. Therefore the question for this paper can be expressed as *is it reasonably foreseeable that Canada's continued release of GHG emissions, with the knowledge that other nations are also emitting GHGs, will result in climate change induced impacts to Palau?*

The state of the scientific understanding as presented in the introduction is essentially: GHGs trap heat on earth, their atmospheric concentrations are increasing because of annual global carbon emissions approaching 7 billion tonnes, and scientists believe the 21st century will experience temperature increases as a result of the change in GHG concentration. Canada recognizes the concern over GHGs. In fact, one of the first international climate change conferences was held in Toronto

⁵⁴ *M'Alister (or Donoghue) v. Stevenson* [1932] AC 562 (HL); *Palsgraf v. Long Island Railroad Co.* 1928 162 NE 99 (NYCA); *Haynes v. Harwood* [1935] 1 KB 146 (CA).

in 1988.⁵⁵ Furthermore, many Canadian scientists are authors of IPCC reports and have been actively researching the climate change-induced impacts that may occur in Canada.⁵⁶

The nature of GHG emissions is that they become fully mixed in the atmosphere almost immediately and thus any states' contribution fuels the global climate change experienced by all. Canada is releasing GHGs with knowledge of the risk of environmental consequences and knowledge that other nations are doing the same. These risks of harm include projections from the IPCC that global mean surface temperature will increase at least 1.4°C and as much as 5.8°C, global mean sea level will rise between 0.09 and 0.88 meters from 1990 to 2100 (resulting in significant land loss in small island states) and that there is likely to be an increase in the peak wind and mean and weak precipitation intensities of tropical cyclones.⁵⁷ The likely increase in wind and precipitation intensities has been estimated by the IPCC with a probability between 66 and 90% and some researchers have estimated that in the absence of climate-mitigation policies, warming between 1.7°C and 4.7°C has a 90% probability.⁵⁸ These increases could result in risk to human life, coastal erosion and damage to coastal buildings and infrastructure and damage to coastal ecosystems such as coral reefs and mangroves.⁵⁹

⁵⁵ This was the World Meteorological Organization's Conference on Climate Change in 1988 referred to in: C. Rolfe, *Turning Down the Heat: Emissions Trading and Canadian Implementation of the Kyoto Protocol* (Vancouver: West Coast Environmental Law Research Foundation, 1998) at 57.

⁵⁶ Environment Canada. 1990. *Implications of Climate Change for Small Coastal Communities in Atlantic Canada*. Climate Change Digest CCD 90-01; Environment Canada. 1988. *Socio-Economic Assessment of the Physical and Ecological Impacts of Climate Change on the Marine Environment of the Atlantic Region of Canada – Phase I*. Climate Change Digest CCD 88-07; Environment Canada. 1988. *Preliminary Study of the Possible Impacts of a One Meter Rise in Sea Level at Charlottetown, Prince Edward Island*. Climate Change Digest CCD 88-02; Environment Canada. 1987. *Effects of a One Meter Rise in Mean Sea-Level at Saint John, New Brunswick, and the Lower Reaches of the Saint John River*. Climate Change Digest CCD 87-04.

⁵⁷ *Supra* note 3 at 15.

⁵⁸ T.M.L. Wigley & S.C.B. Raper. "Interpretation of High Projections for Global-Mean Warming" (2001) 293 *Science* 451.

⁵⁹ Intergovernmental Panel on Climate Change, *Climate Change 2001: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the Third Assessment Report of the Intergovernmental Panel on Climate Change*, ed. by J.J. McCarthy, O.F. Canziani, N.A. Leary, D.J. Dokken & K.S. White (New York: Cambridge University Press, 2001) at 7.

There is little difficulty with the assertion that sea level rise is reasonably foreseeable. In fact, Environment Canada has recently completed a study of the impacts of sea-level rise on the coast of Prince Edward Island – this province has been “identified as one of the regions most sensitive to sea-level rise in Canada.”⁶⁰ One of the findings of the authors is that if a storm with the same magnitude of the one on January 21, 2000, occurs again when there is an assumed 0.5 m sea-level rise, over \$200 million of property in Charlottetown would be at risk of flooding. Given the IPCC projections of future climate change, the ongoing research of Canadian scientists and potential risks to low-lying island states, it appears that it would be difficult for Canada to argue that it was not reasonably foreseeable that continued GHG emissions would contribute to climate change.

2. Standard of Care

One breaches the standard of care owed to others if one does not satisfy the standard required of the situation. The test to determine the standard of care is the objective test developed in *Vaughan v. Menlove*⁶¹ – did A take reasonable care in regards to the duty owed to B? The specific question for this component of the negligence claim is thus *did Canada take reasonable care in regards to Palau given the scientific understanding of the risks of climate change that was available at the time?*

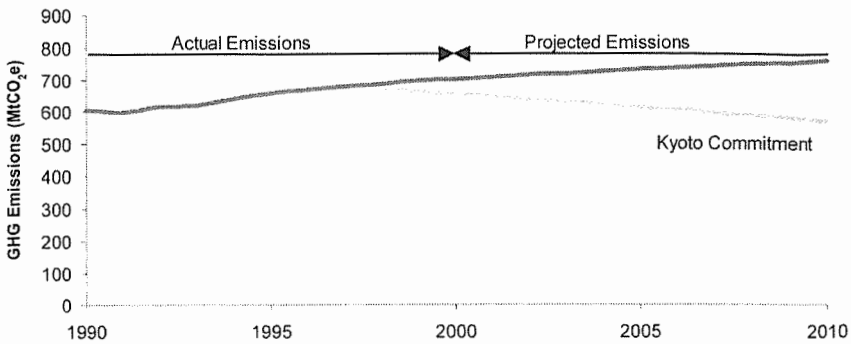
This question should be addressed by first reviewing Canada’s past emissions and projected business-as-usual emissions. Figure 1 to the right presents Canada’s emissions since 1990 and the most recent projections to 2010.⁶²

⁶⁰ Environment Canada, Natural Resources Canada, Rodshaw Environmental Consulting, Canadian Department of Fisheries & Oceans, Department of Oceanography (Dalhousie University), Applied Geomatics Research Group (Nova Scotia Community College), City of Charlottetown and PEI Emergency Measures Organization.. *Coastal Impacts of Climate Change and Sea-Level Rise on Prince Edward Island*. Synthesis Report. 2001. Climate Change Action Fund project CCAF A041.

⁶¹ (1837), 132 ER 490 (CP).

⁶² Actual Emissions: Pollution Data Branch, Environment Canada. August 2001. *1990 to 1999 Greenhouse Gas Emission Estimates for Canada*. <www.ec.gc.ca/pdb>

Projected Emissions: Analysis and Modelling Group - National Climate Change Process, *Canada’s Emissions Outlook: An Update*, National Climate Change Process, December 1999.

Figure 1. Canada's Current Situation

Canada's emissions have steadily increased from 612 million tonnes in 1990 to 704 million tonnes in 2000 and have been projected to increase further still to 764 million tonnes if no climate policy initiatives are undertaken.

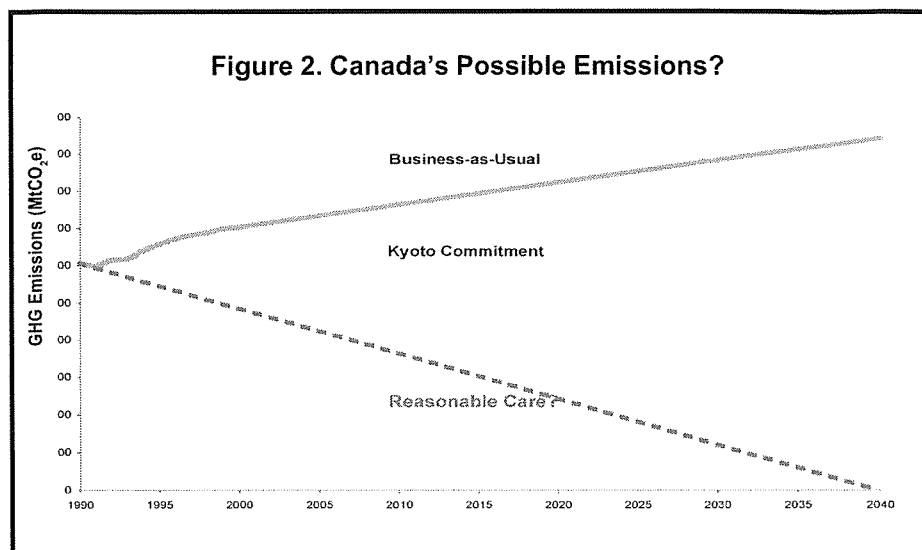
Figure 1 provides a straight-line representation of the emissions reductions necessary for Canada to succeed in its commitments to the *Kyoto Protocol* – a 6% reduction below what the emissions were in 1990 by the period between 2008 and 2012 (or an annual emission of 571 million tonnes in 2010).⁶³ Given the international concern over GHGs, it is definitely unacceptable for Canada's emissions to continue as they have been projected. Reasonable care necessitates emissions reductions otherwise Canada would be in breach of its standard of care to Palau. But what is reasonable care? Is it Kyoto and similar future manifestations of Kyoto or is it far greater reductions?

It is illustrative to look at the history of reduction commitments before the *Kyoto Protocol* ever existed. The World Meteorological Organization's Toronto Conference on Climate Change in 1988 recommended reducing CO₂ below 1988 levels by the year 2005 (and in 1988 the IPCC was established by the World Meteorological Organization and the United Nations Environment Programme).⁶⁴ Two years later, at

⁶³ *Supra* note 2.

⁶⁴ C. Rolfe, *Turning Down the Heat: Emissions Trading and Canadian Implementation of the Kyoto Protocol* (Vancouver: West Coast Environmental Law Research Foundation, 1998) at 57.

the Second World Climate Conference, the federal government committed Canada to stabilizing emissions of GHGs at 1990 levels by 2000.⁶⁵ However in 1991, the House of Commons Standing Committee on Environment recommended a 20% reduction by 2005 and this was repeated in the 1993 Liberal “Red Book” (which stated the aim of 20% reduction from 1988 levels by 2005).⁶⁶ It was in the 1992 Rio Earth Summit that Canada again agreed to return to 1990 levels by 2000.⁶⁷ All of these proposed commitments are presented below in Figure 2.⁶⁸



Canada's Kyoto commitment should not be accepted as the definition of “reasonable care”. The fact that other industrialized countries have similar commitments is also not evidence of reasonable care because everyone could be negligent.⁶⁹ Rather, reasonable care is defined by the conduct that is required given the available scientific understanding of the potential risks. The international negotiations that created the

⁶⁵ *Ibid.* at 64.

⁶⁶ *Supra* note 64 at 64.

⁶⁷ *Supra* note 64 at 64.

⁶⁸ However, the 20% reduction below 1988 levels has been presented as a 20% reduction below 1990 levels because this author has been unable to find any pre-1990 data.

⁶⁹ The prevailing custom by all countries could be negligent as in *The T.J. Hooper*, 60 F2d 737 (2d Cir. 1932), where the court found that the custom of all tug owners in not carrying radios constituted negligence.

Kyoto Protocol have little or no connection with the current scientific understanding. If the commitments were derived from the risk of harm, they would have been made for much greater reductions. Dutch researchers have estimated that to keep sea-level rise less than 0.4 meters by 2100, emissions reductions between 37 and 64% below 1990 levels by 2010 would be necessary (far greater than any of the existing Kyoto commitments).⁷⁰ Furthermore, researchers have estimated that even with a fully implemented Kyoto, warming by 2050 "would be only about 1/20 of a degree less than what is projected by the IPCC."⁷¹ As a result, even if Canada satisfies Kyoto and makes further similar commitments, reasonable care might demand greater action. Therefore Canada could still be in breach of its standard of care.

The AOSIS coalition has been attempting to persuade the international community to adopt stronger commitments since its creation. In a claim before the ICJ, Palau might argue that the high risk of environmental consequences to their nation necessitates far greater reductions, for instance 30% below 1990 by 2005 with a straight line continued into the future.

While in this hypothetical claim, Canada and Palau will likely have vastly different interpretations of what defines reasonable care, the only critical interpretation is the one determined by the ICJ. Recognizing that the scientific understanding of the risks of climate change is constantly evolving with continuous advances, how can reasonable care be determined? One appropriate manner to determine the standard of care may be in the following iterative steps:⁷²

1. Given the international scientific understanding available in 1990, what does reasonable care require Canada's emissions to be in 1991?
2. Given the international scientific understanding available in 1991, what does reasonable care require Canada's emissions to be in 1992?
3. Given the international scientific understanding available in (x), what does reasonable care require Canada's emissions to be in (x+1)?

⁷⁰ *Supra* note 64 at 64.

⁷¹ *Supra* note 59 at 855.

⁷² This article limits analysis of conduct to the post-1990 period.

This iterative process would be a just manner in which to develop a “reasonable care” line. This reasonable care line could then be plotted alongside Canada’s emissions projections and Kyoto commitments. This is presented below in Figure 3.⁷³ Assuming that Canada satisfies Kyoto and that reasonable care requires even lower emission levels, all emissions *in excess* of reasonable care (above the line) are in breach of the negligence standard and all emissions *below* reasonable care are consistent with the negligence standard.

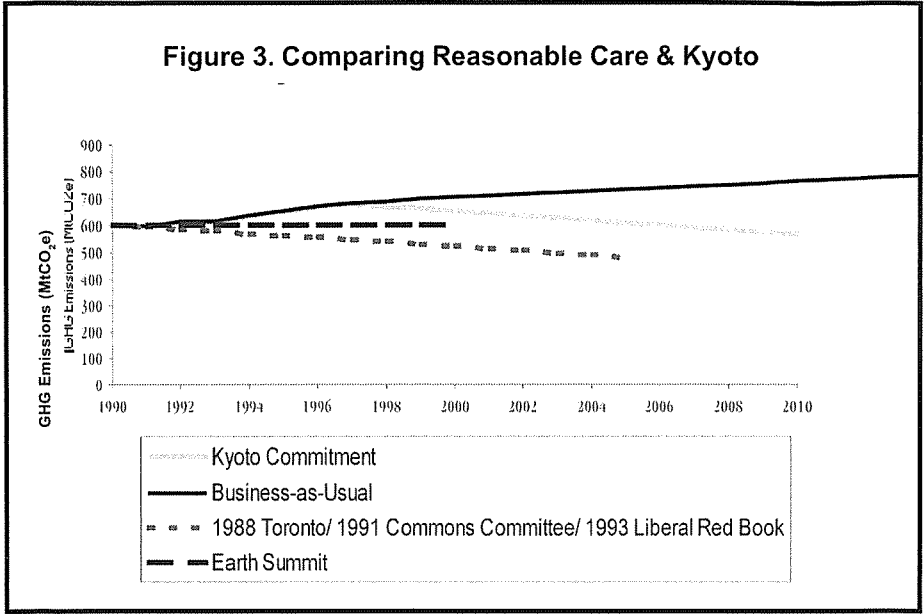


Figure 3 illustrates that if reasonable care is continued into the future then emissions reach zero in 2040. However, if Kyoto is simply continued, Canada is still emitting over 300 million tonnes in 2040. While the reasonable care line in Figure 3 maybe quite different from what the ICJ would determine, as long as reasonable care is below Kyoto then emissions in excess are the result of Canada’s negligence. This apportionment of Canada’s GHG emissions into discrete negligent and non-negligent portions is important because it is unlikely that all of Canada’s

⁷³ Figure 3 assumes that reasonable care was a 30% reduction below 1990 levels by 2005 and the business-as-usual and Kyoto commitment lines are simply continuations to 2040 from their trend in 2010.

GHG emissions would be considered negligent – the sources of energy in the industrialized world are predominantly fossil fuels. Rather the court would determine what are reasonable GHG emissions at a given time and thus any emissions in excess would be negligent. This negligent portion of Canada's GHG emissions are the result of Canada permitting emissions of GHGs in excess of what is reasonable – breaching the standard of care owed to Palau – and it is this portion of the global commons for which Canada is liable.

3. Causation

Establishing causation or cause in fact is the third component necessary to prove negligence. Negligence law typically uses the “but for” test from *M'Alister (or Donoghue) v. Stevenson*⁷⁴ to determine causation – but for the snail in the plaintiff's ginger beer, she would not have been sick. The plaintiff must prove that the defendant's conduct caused the harm experienced by the plaintiff. In other words the burden is on the plaintiff to prove causation. Therefore the necessary question is *but for the GHG emissions from Canada, would Palau still have experienced climate change-induced impacts?*

Palau would need to first establish that the sea-level rise and extreme weather impacts experienced are the result of human-induced climate change and not the result of natural climate variability and secondly, that Canada's GHG emissions caused this climate change. Given that the balance of probabilities standard (50% + 1) is to be applied, science will likely be able to establish a sufficient correlation that climate change was due to human activities. Therefore, causation hinges on the second issue. Since Canada's contribution in 1998 was only 1.9% of global fossil fuel GHG emissions,⁷⁵ it cannot be said that in the absence of Canada, Palau would not have experienced any sea-level rise or extreme weather impacts. Palau would have still been affected by climate change impacts because the remaining nations of the world would still have caused increases in the atmospheric concentrations of greenhouse gases. As a result, Palau clearly fails the “but for” test in establishing Canada's liability. However, courts have recognized exceptions to the “but for” test.

⁷⁴ [1932] AC 562 (HL).

⁷⁵ *Supra* note 18.

Exceptions to the “but for” test have been successful in cases where there are multiple negligent defendants. In *Corey v. Havener*⁷⁶ a horse pulling a carriage was frightened when two motor vehicles simultaneously came up behind and passed the animal on either side at high speed. The carriage tipped resulting in personal injuries to the occupants. The court barred each of the defendants from using the “but for” test against each other – for example, saying that “the horse would still have been frightened even without my negligent conduct”. A further exception to causation occurred in a case where the plaintiff was wounded through the negligent conduct of one of two defendant hunters but could not identify which defendant actually caused the injury.⁷⁷ In this case, the court shifted the burden to each defendant to prove that his conduct could not have caused the plaintiff’s injury.⁷⁸

In the seminal case of *Sindell v. Abbott Laboratories et al.*,⁷⁹ the critical issue was whether the defendants, which were pharmaceutical companies, could be found liable based on their percentage share of the marketplace where a plaintiff cannot identify which specific manufacturer produced the drug that caused the harm. The plaintiff was successful in this case because the court adopted the theory of “market share liability” by reasoning that “as between an innocent plaintiff and negligent defendants, the latter should bear the cost of injury.”⁸⁰

Market share liability may be argued by Palau to establish Canada’s liability for its percentage contribution to Palau’s harm. Market share liability has been successfully adopted by courts in Washington,⁸¹ Florida,⁸² New York⁸³ and Hawaii.⁸⁴ Though no courts in Canada have yet put this theory to practice it has become statutory law in British Columbia with the *Tobacco Damages and Health Care Costs Recovery Act*,⁸⁵ which allows the provincial government to sue tobacco compa-

⁷⁶ (1902), 65 NE 69 (Mass. S.J.C.).

⁷⁷ *Summers v. Tice*, 199 P.2d 1 (Calif.S.C. 1948).

⁷⁸ J.J. Ortego, *Market Share Liability Theory of Product Liability Litigation*. (American Law Institute – American Bar Association Continuing Legal Education, 1996)

⁷⁹ *Sindell v. Abbott Laboratories et al.* 607 P.2d 924 (Calif.S.C. 1980).

⁸⁰ *Ibid.* at 936.

⁸¹ *Martin v. Abbott Laboratories*, 689 P.2d 368 (Wash.S.C. 1984).

⁸² *Conley v. Boyle Drug Co.*, 570 So.2d 275 (Fla.S.C. 1990).

⁸³ *Hymnowitz v. Eli Lilly & Co.*, 539 N.E.2d 1069 (N.Y.C.A.); cert denied, 493 U.S. 944 (1989).

⁸⁴ *Smith v. Cutter Biological, Inc.*, 823 P.2d 717 (1991, Hawaii).

⁸⁵ S.B.C. 2000, c. 30.

nies by apportioning liability based on the manufacturers' share of the market. Therefore, this theory exists in at least two common law jurisdictions and could very well be one of the "general principles of law recognized by civilized nations."⁸⁶ The ICJ could apportion causation to Canada for its negligent contribution of GHG emissions to the global commons in order to determine liability. Furthermore, because Canada ought to have knowledge that the "but for" test is entirely inappropriate in the context of climate change, Canada may be barred from invoking it as a defence.

Canada is currently responsible for nearly 2% of global GHG emissions and a portion of that since 1990 may be deemed by the ICJ as unreasonable conduct given the evolving state of scientific understanding (see the previous section – Standard of Care). The United States courts have been clear that if a plaintiff does not bring 100% of the manufacturers before the courts then the plaintiff can still succeed though not recover 100% of their damages.⁸⁷ Therefore, Canada may be responsible for something less than 2% of the damage estimates of Palau's impacts. But damage claims from Palau and other members of AOSIS may run into the billions of dollars and even a fraction of 2% could become a sizable liability.

4. Damage Compensation

The objective of any liability claim is to receive compensation for the harm suffered. The *Chorzow Factory Case* provides the objectives of damage compensation:

... reparation must, as far as possible, wipe out all the consequences of the illegal act and reestablish the situation which would, in all probability, have existed if that act had not been committed. Restitution in kind, or, if this is not possible, payment of a sum corresponding to the value which a restitution in kind would bear...⁸⁸

Significant damage is predicted for the small island states of the world. While this author has been unable to locate damage cost estimates for island states, researchers have estimated that a 0.5 m sea-level rise by

⁸⁶ *Supra* note 51.

⁸⁷ *Supra* note 83, 84 & 85. A plaintiff's failure to bring all manufacturers to court is not a defence, but the plaintiff will be unable to recover 100 % of the estimated damages.

⁸⁸ *Chorzow Factory (Indemnity) Case* (1928), P.C.I.J., Ser. A., No. 17.

2100 could cause cumulative impacts to U.S. coastal property between \$20 and \$150 billion (US\$).⁸⁹ Estimates for Poland have the cost of sea wall construction at \$6 billion.⁹⁰

Palau would need to demonstrate that real damage has occurred and that real costs have been incurred. Examples of impacts from sea-level rise include loss of land damages or the costs of seawall construction and examples from extreme weather could include loss of life, damage to property or economic damages.

Quantifying an appropriate compensation for Palau's impacts may be complicated by the recent developments at Part 2 of the Sixth Conference of the Parties (COP) in Bonn in July, 2001. In a draft decision, the COP declared its intention to create a new funding component on the Global Environment Facility which will "provide financial resources to developing country parties, in particular least developed and *small island developing states*" for, *inter alia*, adaptation activities.⁹¹ Canada, along with the member states of the European Community, Iceland, New Zealand, Norway and Switzerland, have jointly declared their willingness to collectively contribute US\$410 million annually by 2005 for this new funding programme.⁹² In fact, Canada has expressed the intention of immediately contributing CAN\$10 million to "enable the prompt start of this fund."⁹³ This special fund for adaptation and other activities has the potential to provide small island states with the necessary funds to mitigate, at least partially, their future damages. This could reduce Canada's liability for the Tran boundary effects of greenhouse gases. However, if Palau's future damages greatly exceed any adaptation funding that was actually provided to mitigate damages, costly losses will still be realized and liability will still exist. While this fund is a promising development, it remains to be seen whether the funding available will be anything near the level necessary to offset the projected damages.

⁸⁹ *Supra* note 59 at 365.

⁹⁰ *Supra* note 59 at 365.

⁹¹ *Review of the Implementation of Commitments and of Other Provisions of the Convention: Report of the Global Environment Facility to the Conference*, FCCC/CP/2001/L.4/Rev.1 [emphasis added].

⁹² *Review of the Implementation of Commitments and of Other Provisions of the Convention*, FCCC/CP/2001/L.14

⁹³ *Ibid.*

III. CONCLUSION

The projections of future sea level rise and increased intensities of tropical cyclones as a result of climate change raise complex equity issues between rich, developed countries and vulnerable small island states. This paper has reviewed the international law of state responsibility in the context of climate change yet can provide no clear answers. While there is a "soft law" duty not to harm the environment of another sovereign state, and perhaps this may even be customary law, this obligation is without teeth unless compensation for the harm can be realized. However, it is uncertain by what liability standard this harm could be enforced.

This paper applies the law of negligence which exists in common law jurisdictions with the objective of determining whether Canada could be liable on a standard with a greater degree of culpability than that of strict or absolute liability. This has the purpose of removing the uncertainty of the applicable standard for if one is liable based on negligence then they are certainly liable on strict or absolute liability.

It appears possible that Palau could establish Canada's negligence. However, this would require a complex time-dependent analysis of the standard of care because of the advancing nature of the scientific understanding of the risks of climate change. In addition, the theory of market share liability is necessary to establish causation because of the existence of multiple negligent parties. This would require a tremendous leap in the evolution of international law; in North America, market share liability jurisprudence is limited to the U.S. and in Canada to a single provincial statute. Finally, it is also necessary that Canada continue to recognize the jurisdiction of the ICJ – a recognition that is purely consensual and can be removed at any time.

The difficulties in a climate change state liability claim based on negligence greatly reduce the likelihood of success of such a claim. Nevertheless, international law in this area continues to evolve and the potential for future liability is an issue which should not be ignored by policymakers.